

REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-11 and 14-18 are in this case. Claims 1-11 and 14-18 have been rejected under § 102(b) or § 103(a). New independent claims 19 and 20 have now been added, and original independent claims 1 and 14 canceled. Dependent claims 4-11, 15, 16 and 18 have been amended. Dependent claims 2, 3 and 17 have been canceled.

The claims before the Examiner are directed toward a projectile device and corresponding method for propelling a shell which provide three-stages of propulsion including launch propulsion from propellant located in a cartridge, cruise propulsion from a cruise rocket motor, and acceleration to penetration velocity provided by an acceleration rocket.

§ 102(b) & § 103(a) Rejections

The Examiner has rejected claims 1-4 and 14-18 under § 102(b) as being anticipated by Schricker (WO 90/00244). The Examiner has also rejected claims 5-11 under § 103(a) as being unpatentable over Schricker in view of one or both of McIngvale (US 4638737) and Johnson (US 4630050). The Examiner's rejections are respectfully traversed.

Referring specifically to Schricker, this discloses a shoulder-launched anti-armor rocket which includes a launch propulsion device (24) and a boost propulsion device (22). The entire propulsion system includes only two stages, and both propulsion stages are contained within the rocket which is launched from an open-backed tube.

In contrast, the device and method of the present invention relate to a shell for firing from a gun wherein "launch propulsion" is provided by a propellant located in a cartridge associated with the shell prior to firing. A cruise rocket motor is then operative to maintain a substantially constant cruise velocity of the shell for a first period after leaving the barrel of the gun. Finally, an acceleration rocket motor accelerates the shell from the cruise velocity up to a penetration velocity in a final stage of flight.

The use of a three-stage propulsion device, particularly including a cruise rocket motor distinct from the launch propulsion system to maintain a substantially constant cruise velocity for a first period after leaving the barrel of the gun, is neither taught nor in any way suggested by the art of record.

While continuing to traverse the Examiner's rejections, the Applicant has, in order to expedite the prosecution, chosen to submit new independent claims 19 and 20 in order to clarify and emphasize the crucial distinctions between the device and method of the present invention and the device of the Schricker patent cited by the Examiner.

Specifically, new independent claim 19 specifies that the projectile device includes a cartridge associated with the shell prior to firing and containing a launch propellant for accelerating the shell along the barrel of the gun to a muzzle velocity, and that the shell includes a cruise rocket motor configured for maintaining a substantially constant cruise velocity of the shell for a first period after leaving the barrel of the gun and an acceleration rocket motor configured for accelerating the shell from the cruise velocity to a penetration velocity in a final stage of flight of the shell.

Similarly, new independent claim 20 specifies a method for propelling a shell fired from the barrel of a gun to pierce armor of a target including: employing launch propellant located within a cartridge for accelerating the shell along the barrel of the gun to a muzzle velocity; employing a cruise rocket motor located within the shell for maintaining a substantially constant cruise velocity of the shell for a first period after leaving the barrel of the gun; and employing an acceleration rocket motor located within the shell for accelerating the shell from the cruise velocity to a penetration velocity in a final stage of flight of the shell.

Dependent claims 4-11, 15, 16 and 18 have been amended to depend directly or indirectly from the appropriate one of new independent claims 19 and 20. Additionally, various minor changes have been made to render the language clearer and consistent with the language of the new independent claims. These changes are believed to be self-explanatory.

Dependent claims 2, 3 and 1.7 have been canceled.

Support for these amendments can be found in the specification. Specifically, support for the cartridge containing a launch propellant can be found in Figure 1C and on page 8 lines 10-11. Support for the firing of the device from a gun can be found in Figure 3 and on page 8 line 14.

New independent claims 19 and 20 now feature language which makes it absolutely clear that the device and method of the present invention provide three-stages of propulsion including launch propulsion from propellant located in a cartridge, cruise propulsion from a cruise rocket motor, and acceleration to penetration velocity provided by an acceleration rocket. The Applicant believes that the amendment of the claims completely overcomes the Examiner's rejections on § 102(b) and § 103(a) grounds.

In view of the above amendments and remarks it is respectfully submitted that independent claims 19 and 20, and hence also dependent claims 4-11, 15, 16 and 18, are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



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